

## Online Support Materials

**Table S1. Pig diet**

Nutrients	g/ kg diet
Protein	153.2
Fat	26.1
Fiber	34.1
Total Kcal/kg diet	2957 kcal
Ingredients	g
Corn	718.9
48% Soybean meal	198.8
Alfalfa meal 17%	50.0
Salt	5.0
Calcium Carbonate	5.8
<sup>1</sup> Swine trace mineral	1.0
<sup>2</sup> Swine vitamins	1.0
Selenium premix	0.5
Choline 60%	0.3
Soybean oil	2.5
Monocalcium phosphate	16.3
Total	1000

Dietary Treatment	Treatment	
Cocoa powder (g/d)	0	26
<sup>3</sup> Dextrin (g/d)	1.24	0
<sup>4</sup> Cellulose (g/d)	6.42	0

<sup>1</sup> Swine trace mineral (PIGMASTER G.F 50 from ADM Alliance Nutrition) per kg: Calcium 22%- 26.4%, Phosphorus 6%, Salt 12% -14.4%, Selenium 12 ppm, Zinc 2450 ppm

<sup>2</sup> Swine vitamins (SWINE VITAMIN PREMIX from DSM) per kg: Vitamin A 4,409,171 IU, Vitamin D3 881,834 IU, Vitamin B12 44 mg, Riboflavin 8,818 mg, d-Pantothenic Acid 17,637 mg, Niacin 30,864 mg

<sup>3,4</sup> Dextrin and cellulose were added to match total soluble and insoluble fiber of cocoa powder.

**Table S2. Biochemical Serum markers at week 7**

Index	Treatment	wk 0	wk 7	p-value
ALP 118-395 U/L*	Control	158.14±24.19	151.71±22.35	
	LGG	184.77±15.19	195.66±18.22	
	Cocoa	150.62±12.09	136.50±8.89	
	LGG+Cocoa	180.25±18.39	162.62±14.19	
ALT 31-58 U/L	Control	54.86±5.47	60.28±3.60	
	LGG	47.33±3.31	50.33±6.41	
	Cocoa	47.75±3.89	46.87±5.55	
	LGG+Cocoa	44.12±2.66	54.62±5.30	
AST 32-84 U/L	Control	33.86±4.50	27.57±2.39	
	LGG	38.22±4.31	34.89±4.37	
	Cocoa	35.62±4.74	28.62±3.36	
	LGG+Cocoa	30.63±4.52	30.13±2.65	
Total bilirubin 0-10 mg/dL	Control	0.129±0.02	0.100±0.00	0.004
	LGG	0.122±0.01	0.156±0.02	
	Cocoa	0.125±0.02	0.138±0.02	
	LGG+Cocoa	0.100±0.00	0.163±0.02	
LDH 380-634 U/L	Control	482±28.35	610±71.4	0.021
	LGG	593±33.60	684.78±69.41	
	Cocoa	525.38±22.74	622.75±51.31	
	LGG+Cocoa	508±38.89	661.75±35.23	
GGT 10-60 U/L	Control	38±1.77	43.28±3.48	0.011
	LGG	41.22±3.14	42.22±3.64	
	Cocoa	38.87±2.92	39.87±3.23	
	LGG+Cocoa	39.63±2.32	44.50±3.92	

Total protein	Control	6.60±0.21	8.50±0.31	0.003
7.9-8.9 g/dL	LGG	7.0±1.96	7.87±0.46	
	Cocoa	6.65±0.24	7.20±0.53	
	LGG+Cocoa	6.65±0.15	7.72±0.26	0.003

\* Indicate normal values expressed in U/L for ALP,ALT,AST,LDH,GGT enzymes and mg/dL for bilirubin AST= Aspartate Transaminase; LDH=Lactate Dehydrogenase; or g/dL for total protein; ALP=Alkaline Phosphatase; ALT= Alanine Transaminase; AST= Aspartate Transaminase; LDH=Lactate Dehydrogenase; ALP=Alanine Phosphatase  
ALT= Alanine Transaminase; AST= Aspartate Transaminase; LDH=Lactate Dehydrogenase; GGT=Gamma-glutamyl transferase

**Table S3. Dietary induced gene expression changes in lymph nodes**

GENE		Dietary Intervention										Main effects <sup>3</sup>		
		Control		Cocoa		LGG		LGG + Cocoa		Diet	Treatment			Diet* Treatment
		$\Delta C_T^1$	Fold of control	$\Delta C_T$ Cocoa	Fold relative to control <sup>2</sup>	$\Delta C_T$	Fold relative to control <sup>2</sup>	$\Delta C_T$	Fold relative to control <sup>2</sup>					
EPX	TBL	12.82 $\pm$		12.30 $\pm$		14.85 $\pm$		14.31 $\pm$						
	N	0.61 <sup>ab</sup>	1	0.61 <sup>a</sup>	1.5	0.61 <sup>c</sup>	0.2	0.61 <sup>abc</sup>	0.3	0.402	<b>0.003</b>	0.991		
	MLN	16.53 $\pm$ 0.73	1	15.53 $\pm$ 0.73	2	15.20 $\pm$ 0.73	2.6	14.94 $\pm$ 0.73	3	0.397	0.201	0.613		
CCL26	TBL	3.87 $\pm$		3.38 $\pm$		4.73 $\pm$		4.21 $\pm$						
	N	0.33 <sup>ab</sup>	1	0.33 <sup>a</sup>	1.4	0.33 <sup>b</sup>	0.5	0.33 <sup>ab</sup>	0.8	0.133	<b>0.016</b>	0.957		
	MLN	4.47 $\pm$ 0.48	1	4.11 $\pm$ 0.48	1.3	4.31 $\pm$ 0.48	1.1	4.40 $\pm$ 0.48	1	0.783	0.892	0.644		
IL-13	TBL	13.38 $\pm$	1	13.59 $\pm$		15.48 $\pm$		14.69 $\pm$						
	N	0.41 <sup>a</sup>	1	0.41 <sup>ab</sup>	0.8	0.41 <sup>c</sup>	0.2	0.41 <sup>bc</sup>	0.4	0.493	<b>0.001</b>	0.231		
	MLN	14.08 $\pm$ 0.69	1	13.05 $\pm$ 0.69	2	13.48 $\pm$ 0.69	1.5	13.68 $\pm$ 0.69	1.3	0.555	0.982	0.380		
TLR2	TBL	8.85 $\pm$		8.58 $\pm$		10.50 $\pm$		10.04 $\pm$						
	N	0.53 <sup>a</sup>	1	0.53 <sup>a</sup>	1.2	0.53 <sup>b</sup>	0.3	0.53 <sup>ab</sup>	0.4	0.505	<b>0.008</b>	0.860		
	MLN	11.90 $\pm$ 0.68	1	11.59 $\pm$ 0.68	1.2	10.75 $\pm$ 0.68	2.2	10.56 $\pm$ 0.68	2.5	0.719	0.120	0.935		
TLR4	TBL	7.82 $\pm$		7.59 $\pm$		9.03 $\pm$		7.88 $\pm$						
	N	0.40 <sup>a</sup>	1	0.40 <sup>a</sup>	1.2	0.40 <sup>b</sup>	0.5	0.40 <sup>a</sup>	0.9	0.097	0.072	0.259		
	MLN	9.30 $\pm$ 0.85	1	8.79 $\pm$ 0.85	1.4	8.67 $\pm$ 0.85	1.5	6.80 $\pm$ 0.85	5.6	0.172	0.136 mean $\pm$ SD)	0.427		
TLR9	TBL	9.83 $\pm$	1	9.65 $\pm$	1.1	10.92 $\pm$	0.5	10.85 $\pm$	0.5	0.736	<b>0.004</b>	0.872		

	N	0.36 <sup>a</sup>		0.36 <sup>a</sup>		0.36 <sup>b</sup>		0.36 <sup>b</sup>				
		14.26 ±		13.67 ±		14.70 ±		13.42 ±				
	MLN	0.81	1	0.81	1.5	0.81	0.7	0.81	1.8	0.264	0.908	0.675
	TBL	12.75 ±		13.18 ±		14.13 ±		13.19 ±		0.564		
<i>IL1b</i>	N	0.43 <sup>a</sup>	1	0.43 <sup>ab</sup>	0.7	0.43 <sup>b</sup>	0.4	0.43 <sup>ab</sup>	0.7	3	0.1191	0.1251
		13.28 ±		14.36 ±		13.80 ±		14.06 ±		0.535		
	MLN	1.07	1	1.07	0.4	1.07	0.7	1.07	0.6	8	0.9226	0.7084

<sup>1</sup> Data represent  $\Delta$ Ct values after gene expression was normalized to the housekeeping gene (Ct gene-Ct housekeeping gene) for each dietary treatment

<sup>2</sup> Changes in gene expression expressed as fold change compared to the control group which was designated as 1 fold change.

<sup>3</sup> Data represent p-values associated with the diet, treatment or Diet \* Treatment effects from the normally distributed ANOVA model